EXPANDED DATA TRANSFORMATION

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Assumptions

$$\underbrace{A \overset{\alpha}{\underset{\alpha'}{\rightarrowtail}} A' \quad \vee \quad A' \overset{\alpha'}{\underset{\alpha}{\twoheadrightarrow}} A}_{\text{equivalent}} \qquad \text{and optionally} \qquad \underbrace{G[A \overset{\alpha}{\underset{\alpha'}{\rightarrowtail}} A'] \vee G[A' \overset{\alpha'}{\underset{\alpha}{\twoheadrightarrow}} A]}_{\text{equivalent}}$$

$$\Downarrow$$

$$\alpha A \wedge \alpha' A' \wedge \alpha'\alpha \wedge \alpha i \wedge \alpha' s$$

$$\underbrace{B \overset{\beta}{\underset{\beta'}{\rightarrowtail}} B' \quad \vee \quad B' \overset{\beta'}{\underset{\beta}{\twoheadrightarrow}} B}_{\text{equivalent}} \qquad \text{and optionally} \qquad \underbrace{G[B \overset{\beta}{\underset{\beta'}{\rightarrowtail}} B'] \vee G[B' \overset{\beta'}{\underset{\beta}{\twoheadrightarrow}} B]}_{\text{equivalent}}$$

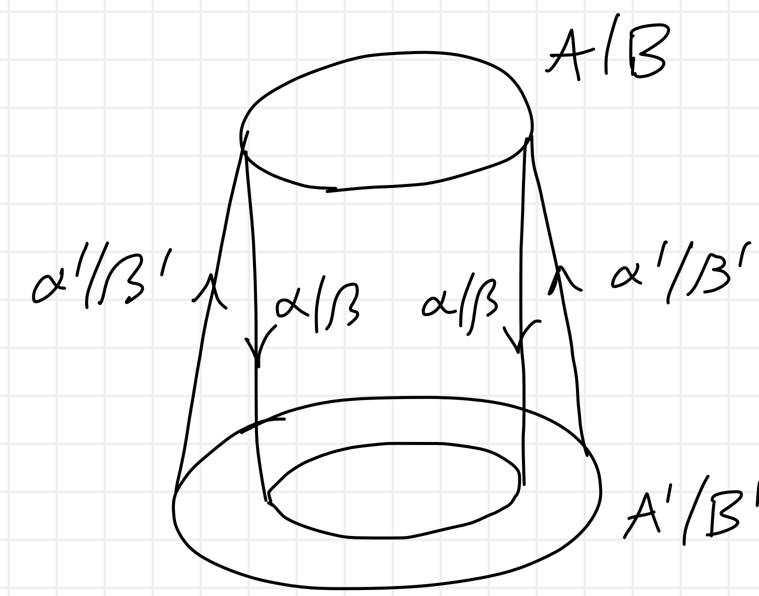
$$\Downarrow$$

$$\beta B \wedge \beta' B' \wedge \beta'\beta \wedge \beta i \wedge \beta' s$$

(see separate 'Domain Mappings' notes)

key property : α', β' surjective — they map the new expanded data to all the old data

different choices of α, β are possible in general for the same α', β',
i.e. the same old data may be expanded in different ways as new data



Default Approach

use α, β as inverses of α', β'

$\Downarrow$

everything works the same as in the isomorphic data transformation, whose proofs only use $\alpha'\alpha$ and $\beta'\beta$ but not $\alpha\alpha'$ and $\beta\beta'$ (which are missing here), but some pictures are slightly different since things may not be isomorphic: